SECTION 7
ALTERNATIVE DEVELOPMENT AND EVALUATION

The alternative development and evaluation process included numerous stakeholder and public input opportunities to gain input on the alternatives and the evaluation criteria. The development and evaluation of alternatives involved a collaborative effort between the project study team and the project stakeholders. This included numerous coordination meetings with members of the City of Sedona, ADOT, the Sedona Airport Authority, and the DMJM Harris team (the consultant to the City of Sedona).

A concept workshop and two public meetings were conducted to allow public input opportunities. The concept workshop was conducted on August 4, 2005. The purpose of this meeting was to let a representative cross-section of interested stakeholders within the study area become familiar with the project, to identify problems and needs along the corridor, to generate a framework for evaluation, and to generate feasible concepts. Concept Workshop meeting minutes are attached in Appendix A.

Public open houses were held on September 22, 2005 and November 15, 2005. The first public meeting was held on September 22, 2005 in the Fellowship Hall at the Crest View Church on North Airport Road. The purpose of this meeting was to allow the general public to identify problems and needs along the corridor, and to provide community suggestions on the study. In addition, six alternatives for the Soldiers Pass Traffic Area were presented to gain public input. Eighty-five people signed in for this public meeting. Comment forms and handouts were provided to allow a forum for formal public input. This information was also presented on the City of Sedona website for further public comment opportunities. The meeting handout, presentation boards, and a summary of public comments can be found in Appendix A.

The second public meeting was held on November 15, 2005 at the Best Western Inn on North Airport Road. The purpose of this meeting was to present the final three feasible alternatives, display the comparative evaluation of the alternatives, and solicit public input on a recommendation. Comment forms were provided to allow a forum for formal public input; the information was presented on the City of Sedona website for further input. The meeting handout, presentation boards, and a summary of public comments can be found in Appendix A.

7.1 CONCEPT WORKSHOP

As discussed above, the concept workshop was conducted in order to identify problems and needs along the corridor in order to begin generating feasible concepts and framework for evaluation. The discussion of problems and needs at the workshop included the following:

- Traffic from the Airport has increased and will continue to increase.
- Delay to make a left turn onto SR 89A from the cross roads keeps increasing, and improvements are needed.
- Vehicles wait a long time at the Airport Road intersection to get onto SR 89A, especially at dusk when tourists come down from the mesa following the sunset.
- There is no Two Way Left Turn Lane striped in the median of SR 89A at Airport Road, it is striped as left turn bays. Therefore there is no opportunity for left turning traffic from Airport Road to use the middle lane as refuge, this adds more delays.
- There should be consideration for a signal at Saddlerock Circle. The driveway across from Saddlerock Circle adds traffic to the intersection delaying residents from accessing the Highway.

- There is a concern about having traffic signals or roundabouts spaced too close together.
- The solution for this area should consider future traffic demands along the SR 89A corridor.
- Whatever solution is recommended for this area, it should be something supported by the community.
- Possible roadway connections between Airport Road and Soldiers Pass should be considered as solutions during this study.
- The study should consider traffic accessing the West Sedona School. There is bus and parent drop off traffic to consider.
- It is important to minimize impacts to business access in the area.
- The businesses on the east side of Soldiers Pass Road rely on the traffic signal at SR 89A for access, moving this signal or realigning the roadway would have impacts on these businesses.

Small group discussions generated many feasible concepts that were further refined to generate feasible conceptual alternatives for the Level 1 evaluation. As previously mentioned, a detailed explanation of the concept workshop can be found in Appendix A in the Concept Workshop Meeting Minutes.

7.2 LEVEL 1 EVALUATION

The input from the concept workshop and stakeholders meeting was combined to create feasible conceptual alternatives. Six conceptual alternatives were developed for the Level 1 evaluation and are shown in Figures 7.1, through 7.7.

7.2.1 Level 1 Alternatives

Palo Verde Alternative (Figure 7.1)

Palo Verde would implement a traffic signal at the intersection of Airport Road and SR 89A, and no other roadway improvements would be included. The distance between Soldiers Pass Road and Airport Road is less than desirable for two traffic signals on a major highway and could make signal coordination difficult.

Mesquite Alternative (Figure 7.2)

This alternative would implement a roadway connection parallel to SR 89A between Airport Road and Saddlerock Circle. An extension of Soldiers Pass Road south of SR 89A would allow access from this roadway to SR 89A. Airport Road could be realigned further to the east providing quarter-mile spacing for another traffic signal along SR 89A. This realignment of Airport Road to the east would require new roadway construction with a fairly steep grade. A preliminary profile of this new roadway is displayed on Figure 7.4.

Sycamore Alternative (Figure 7.3)

This alternative would relocate Soldiers Pass Road to intersect SR 89A opposite Airport Road, and a traffic signal would be installed at this new intersection. The traffic signal at Soldiers Pass Road would be removed. If warranted, a traffic signal could also be installed at Saddlerock Circle while still maintaining desirable separation between the traffic signals. The realignment of Soldiers Pass Road would require new roadway construction with a fairly steep grade. A preliminary profile of this new roadway is displayed on Figure 7.4.

Airport Road:

Install new signal

Soldiers Pass Road:

Signal to remain

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Figure 7.1

Level 1: Palo Verde Alternative
Soldiers Pass Road Area Traffic Study

Soldiers Pass Road:

Signal to remain

East Intersection:

Install new signal

Legend:

Proposed roadway

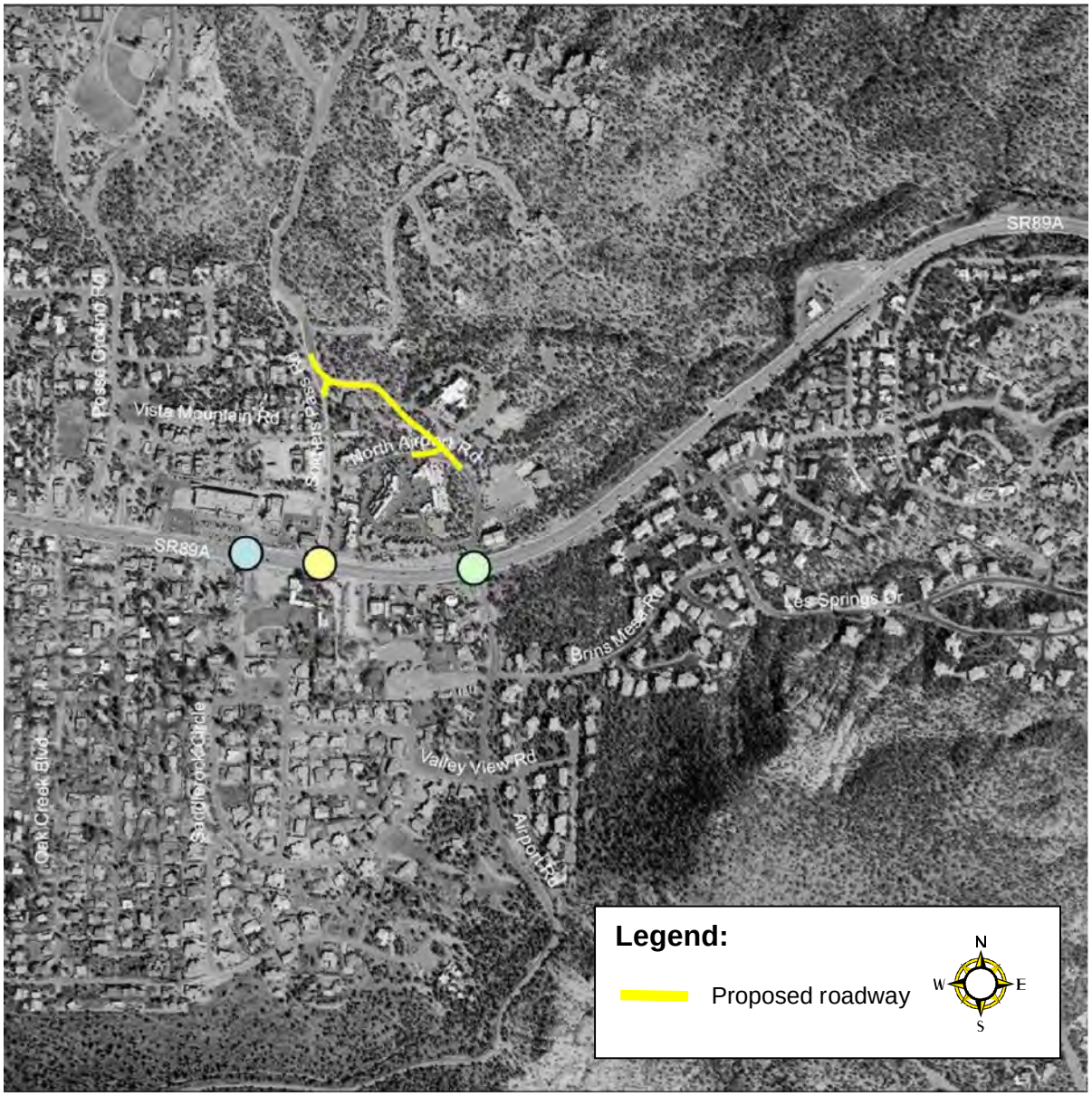
Saddlerock-Airport Rd Connection
(Route still to be determined)

N
W
E
S

Figure 7.2

Level 1: Mesquite Alternative
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM



Saddlerock Circle:

Install new signal

Soldiers Pass Road:

Remove signal

Airport Road:

Install new signal

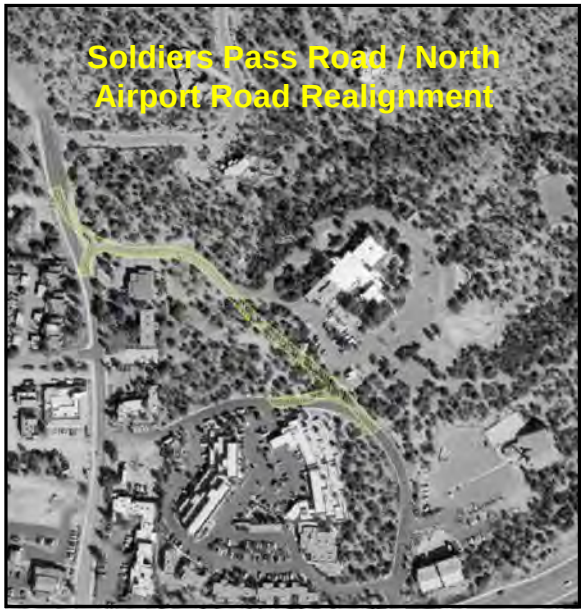
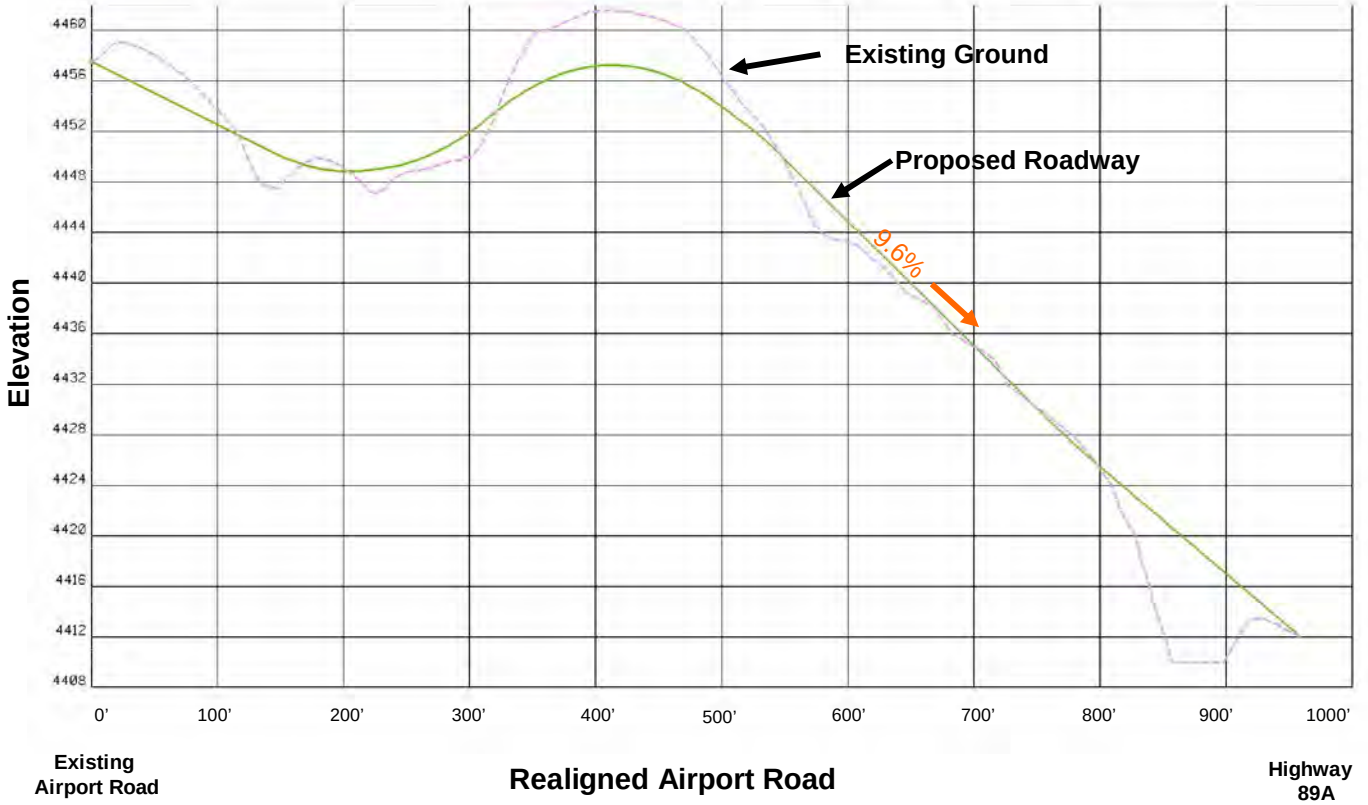


Figure 7.3

Level 1: Sycamore Alternative
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM

Mesquite Connectivity Profile



Sycamore Realignment Profile

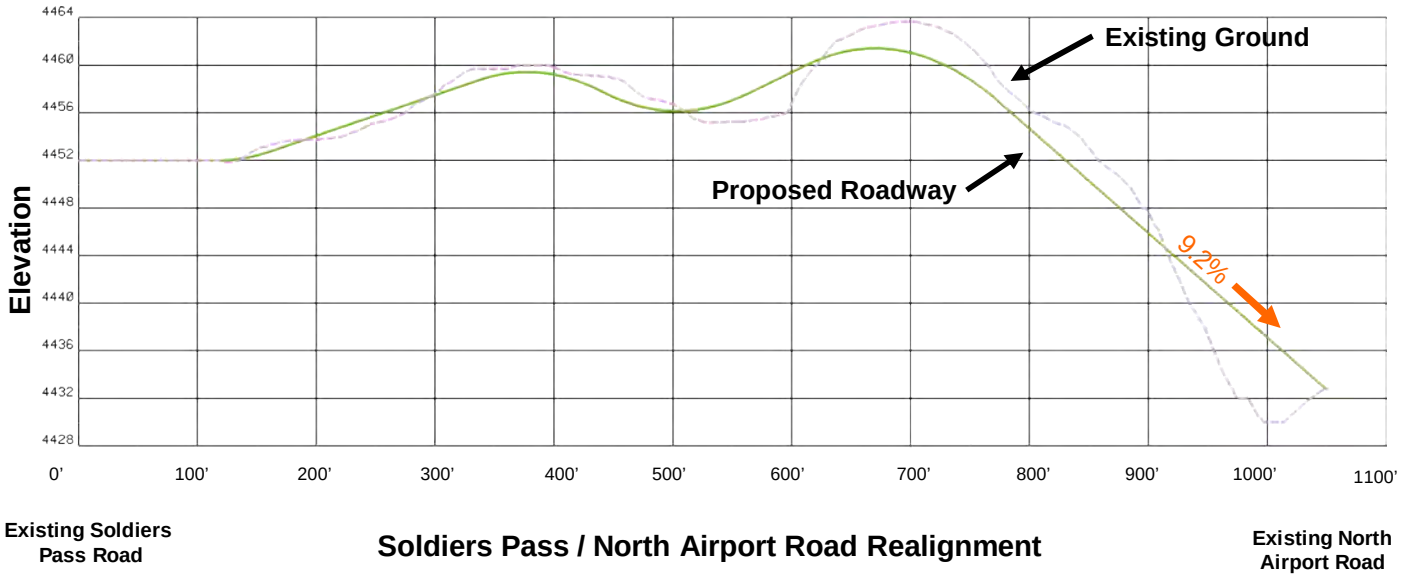


Figure 7.4

Alternative Profiles
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM

Soldiers Pass Road:

Modify signal

Elk Road:

Install new signal

Legend:

Proposed roadway

Saddlerock-Airport Rd Connection
(Route still to be determined)

N
W
E
S

Figure 7.5

Level 1: Desert Willow Alternative
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM

New roundabout locations:

- Realigned Posse Ground Road
- Soldiers Pass Road
- Airport Road
- Les Springs Road

Legend:

Right in, right out

N
W
E
S

Figure 7.6

Level 1: Acacia Alternative
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM

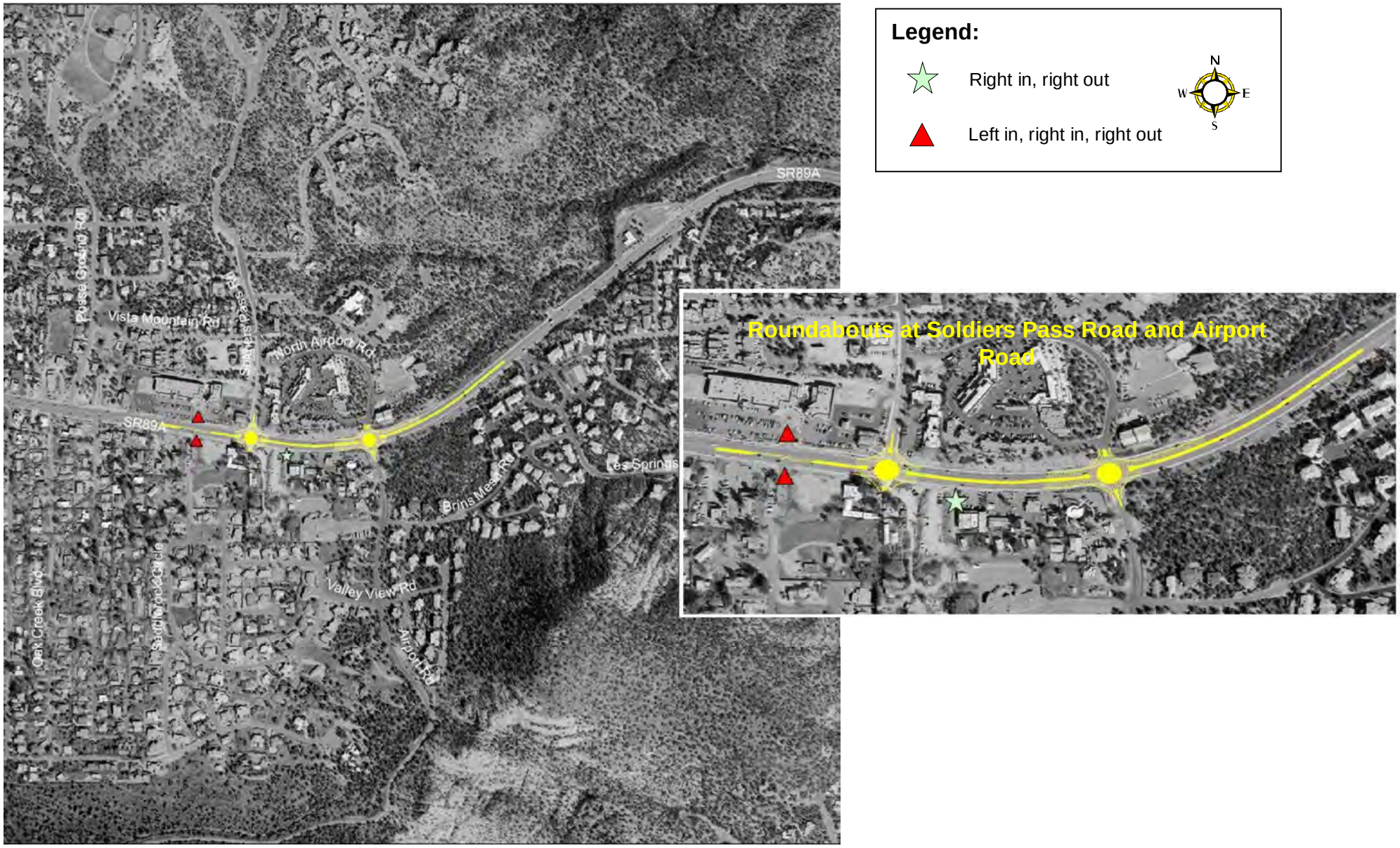


Figure 7.7

Level 1: Ironwood Alternative
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM

Desert Willow Alternative (Figure 7.5)

Desert Willow would implement a roadway connection parallel to SR 89A between Airport Road and Saddlerock Circle. Elk Road would allow access from this roadway to SR 89A. This would allow access to a traffic signal from the south while avoiding the removal of Biddle's Outdoor Center. Traffic signals at Soldiers Pass and Elk Road would function as a combined intersection. This type of intersection can be difficult to coordinate with adjacent signals and may induce additional delay along SR 89A.

Acacia Alternative (Figure 7.6)

Four roundabout intersections would be constructed at Les Springs Road, Airport Road, Soldiers Pass Road, and Posse Ground Road. The roundabout intersections provide control for all movements at these locations without the use of any traffic signals. A raised median would be implemented along the highway, limiting left turn and U-turn movements to the roundabouts.

Ironwood Alternative (Figure 7.7)

Roundabout intersections would be constructed at Soldiers Pass Road and Airport Road. The roundabout intersections provide control for all movements at these locations without the use of any traffic signals. A raised median would be implemented along the highway, limiting left turn and U-turn movements to the roundabouts.

7.2.2 Level 1 Criteria and Evaluation

After analysis of the study area it was determined that there are no fatal flaw criteria for the proposed concepts. Therefore, the Level 1 feasible concepts were evaluated based on public and stakeholder input. As previously mentioned the six feasible concepts at this level were presented at Public Meeting #1. There were numerous public comments received at the meeting. The project team then took the comments and evaluated each alternative. The alternatives were combined, altered, and some eliminated based on the input received. The following is an explanation of the results of each alternative.

Palo Verde Alternative

The Palo Verde Alternative was not considered flawed at this level of evaluation; however, because of the traffic operational problems with the closely spaced signals it was considered a short-term solution. Therefore, the alternative was carried forward to the next level of evaluation as a short term implementation step to the Sycamore Alternative.

Mesquite Alternative

The Mesquite Alternative was not considered flawed at this level of evaluation, and was carried forward to Level 2 evaluation.

Sycamore Alternative

The Sycamore Alternative was not considered flawed at this level of evaluation. It was considered a feasible long-term solution for the corridor. Therefore, it was combined with the Palo Verde alternative for implementation purposes.

Desert Willow Alternative

The Desert Willow Alternative was not preferred by the public or stakeholders. The possible deterioration of traffic operations on SR 89A due to the signal overlap phasing was considered unfavorable. Therefore, this alternative was eliminated from further consideration.

Acacia Alternative

The Acacia Alternative was not considered flawed at this level of evaluation. It was considered a feasible long-term solution for the corridor. Therefore, it was combined with the Ironwood alternative for implementation purposes. The roundabout at Les Springs Drive was not carried forward to the level 2 evaluation because a controlled intersection at Airport Road can provide convenient access to SR 89A without the need to upgrade the Les Springs Intersection.

Ironwood Alternative

The Ironwood Alternative was not considered flawed at this level of evaluation; however, the alternative would only provide intersection control at Soldiers Pass Road and Airport Road and therefore was considered a short-term solution. The alternative was carried forward to the next level of evaluation as a short term implementation step to the Acacia Alternative.

As a result of the Level 1 evaluation, one alternative was eliminated from further consideration and the other five alternatives were combined and refined into three remaining alternatives for further evaluation in Level 2.

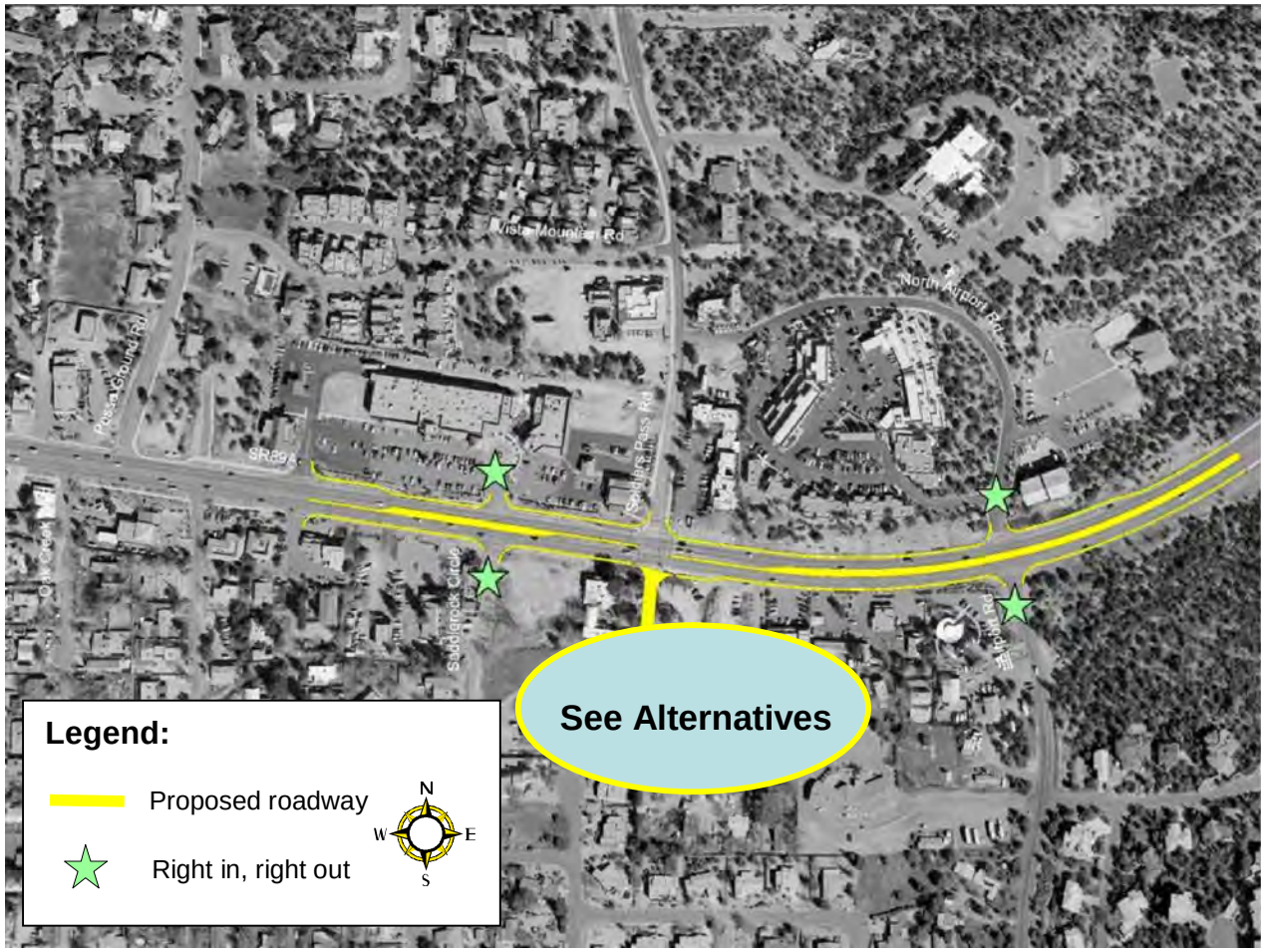
7.3 LEVEL 2 EVALUATION

At the commencement of the Level 2 evaluation, the five remaining concepts listed above were renamed and slightly modified based on issues discovered during the Level 1 evaluation and public input. The Level 2 evaluation included the three alternatives shown in Figures 7.8, 7.9, and 7.10.

7.3.1 Level 2 Alternatives

Jackrabbit Alternative (Figure 7.8)

The Jackrabbit Alternative is the refined version of the Level 1 Mesquite Alternative. The alternative would maintain a signalized intersection at Soldiers Pass Road with a roadway extension of Soldiers Pass Road south of SR 89A. The new roadway would provide the traffic accessing SR 89A from Airport Mesa, Les Springs Drive, and Saddlerock Circle an opportunity to access a traffic signal at Soldiers Pass Road. SR 89A would be widened 5’ on each side to provide for raised medians and bike lanes. Bus pull-outs would be provided on the departure side of the signalized intersections, which also accommodates u-turn movements at these intersections. The Airport Road and Saddlerock Circle intersections would become right-in/right-out access points. The raised 16’ medians provide access control from Old Marketplace through Airport Road. An additional median between Oak Creek Blvd and Posse Ground Road may be included to prevent left-in movements into both intersections; this access control was considered to reduce cut through traffic along Posse Ground Road.



Soldiers Pass Road:

Signal to remain

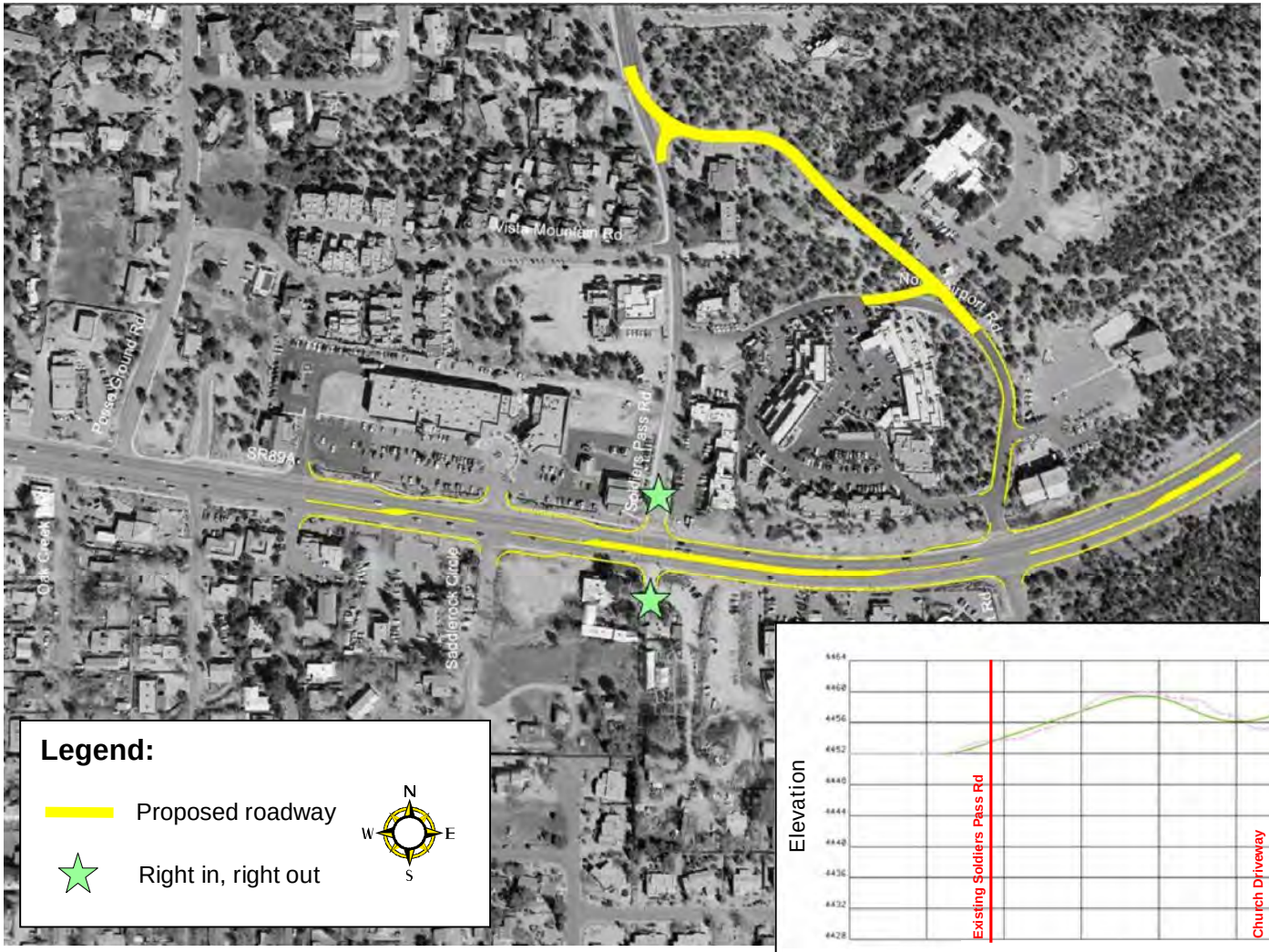
Alternative 1

Alternative 2

Figure 7.8

Level 2: Jackrabbit Alternative
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM



Saddlerock Circle:
Install new signal

Soldiers Pass Road:
Remove signal

Airport Road:
Install new signal

Figure 7.9

Level 2: Javelina Alternative
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM

New roundabout locations:

- Posse Ground Rd
- Soldiers Pass Rd
- Airport Rd

Legend:

Proposed roadway

Right in, right out

N
W
E
S

Figure 7.10

Level 2: Coyote Alternative
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM

Javelina Alternative (Figure 7.9)

The Javelina Alternative is a combination of the Palo Verde and Sycamore Alternatives included in the Level 1 evaluation. The alternative involves the initial implementation of a signal at Airport Road. Soldiers Pass Road would then be realigned to North Airport Road to provide a connection to Airport Road. Traffic from Airport Mesa, Les Springs Drive, and Soldiers Pass would have access to SR 89A at this traffic signal at Airport Road. The signal at existing Soldiers Pass Road would be removed, and the intersection would become a right-in/right-out access point. A second traffic signal would be provided at Saddlerock Circle when traffic signal warrants are met. SR 89A would be widened 5' on each side to provide for raised medians and bike lanes. Bus pull-outs would be provided on the departure side of the signalized intersections, which also accommodates u-turn movements at these intersections. The raised 16' medians would provide access control from Old Marketplace through Airport Road.

Coyote Alternative (Figure 7.10)

The Coyote Alternative is a combination of the Level 1 Acacia and Ironwood alternatives; the multiple roundabouts could be implemented individually. Roundabouts are provided at three intersections: Posse Ground Road which would be connected to Oak Creek Blvd; Soldiers Pass Road; and Airport Road. A 4' median and bike lanes would be provided without widening SR 89A. The 4' raised median would provide access control from Posse Ground Road through Airport Road. The Saddlerock Circle intersection becomes a right in/right-out access point; however, the roundabouts provide multiple u-turn opportunities throughout the corridor. Saddlerock Circle and Les Springs Drive traffic would have access to SR 89A at the Airport Road roundabout.

7.3.2 Level 2 Criteria and Evaluation

The public and key stakeholder input from the concept workshop and first public meeting were collected and condensed into evaluation criteria for the Level 2 evaluation. An evaluation matrix was prepared to evaluate the Level 2 alternatives based on the following categories:

- Safety: along SR 89A and at key intersections
- Access: the ability to access SR 89A and properties along the highway
- Traffic Operations: the amount of delay and congestion experienced
- Environmental Considerations: the effect of each alternative on the environment, particularly related to noise, disruption to undisturbed land, visual impacts, and potential for light pollution
- Right-of-way: the area of private land needed to implement a solution
- Constructability: the time period to implement a solution, and the level of disruption during construction
- Cost: Construction and Right-of-Way

In order to compare the different alternatives, the categories were divided into evaluation criteria and performance measures for the criteria.

Table 7.1 presents the comparative Level 2 evaluation of the three alternatives. The no-build alternative and existing conditions were included in the comparative evaluation at this level.

Table 7.1 – Level 2 Evaluation Matrix

Soldiers Pass Evaluation Matrix								
Evaluation Category	**Evaluation Criteria**	**Performance Measure**	**Comments**	**Existing**	**No-Build Alternative**	**Javelina Alternative**	**Jackrabbit Alternative**	**Coyote Alternative**
Safety	**Intersection Safety**	Number of uncontrolled left turn movements at intersections/driveways	A controlled left turn is considered to be one that is at a traffic signal, roundabout, or prohibited.	50	50	24	24	10
		Potential level of safety at key intersections based on type of control (G/F/P)	Roundabouts are considered highest safety, traffic signals would be fair, and stop signs the lowest.	Poor	Poor	Fair	Fair	Good
	Roadway Safety	Maximum grade of new roadways (G/F/P)	Good - <4%, Fair 4%-8%, Poor Greater than 8%	N/A	N/A	Poor	Good	Good
		Total number of conflict points on 89A	From Oak Creek Blvd to Airport Road, including all intersections and driveways	254	254	154	136	54
Access	**Neighborhood Connection to 89A**	Number of neighborhoods that cannot access a controlled intersection	Neighborhoods defined by City Subdivision boundaries, Access on Public Streets only	5	5	2	2	1
	Property Access to 89A	Number of properties with only partial access to 89A	Partial access is where one or more movements are prohibited	0	0	10	10	11

Soldiers Pass Evaluation Matrix								
Evaluation Category	**Evaluation Criteria**	**Performance Measure**	**Comments**	**Existing**	**No-Build Alternative**	**Javelina Alternative**	**Jackrabbit Alternative**	**Coyote Alternative**
Traffic Operations	**Intersection Performance**	Side Street delay at key intersections	Average delay of all movements per vehicle (Sec)	1,500.5	2,720.1	301.8	246.2	111.4
	Access Delay	Left turn delay at key access locations	Delay to wait for a gap, traffic signal, or the delay to drive to a roundabout and make a U-turn	108.2	210.3	210.5	207.9	187.59
	Roadway Delay	Average time (seconds) to travel from Oak Creek Blvd to Airport Road	Based on Syncro or Rodel Analysis results (Assume 30 MPH Running Speed between Roundabouts)	91	98.3	113.8	110.5	154
Environmental Considerations	**Noise**	Number of noise receptors located along new roadways (within 100 ft of ROW)	100 feet from ROW (based on ADOT Policy)	0	0	3	9/6	0
	Land	Acreage of undisturbed land affected (land in natural state)		0	0	1.01	< 0.10	< 0.10
	Light Impacts	Number of intersections w/ lighting requirements	Lighting requirements are assumed at all Signalized and Roundabout Intersections	1	1	2	1	3

Soldiers Pass Evaluation Matrix								
Evaluation Category	**Evaluation Criteria**	**Performance Measure**	**Comments**	**Existing**	**No-Build Alternative**	**Javelina Alternative**	**Jackrabbit Alternative**	**Coyote Alternative**
Right-of-Way	**Impacts to Property Owners**	Number of acres of new right of way needed		0	0	1.8	2.23/2.10	1
		Total number of properties affected		0	0	11	18/17	16
		Number of residential properties affected		0	0	2	6/4	2
		Number of commercial properties affected		0	0	9	12/13	14
Constructability	**Construction**	Degree to which the concept has construction impacts to the traveling public and adjacent properties (H/M/L)	Subjective based on the perceived disruption to traffic during the construction of the Alternative	N/A	N/A	Medium	Medium	High
	Implementation	Ability to break Alternative into fundable projects (G/F/P)	Tendency for an alternative to be phased in fundable packages that the City of ADOT could complete based on probable availability of funds	N/A	N/A	Good	Fair	Fair
Cost	**Property**	Estimated Cost of land required	$ based on assumed cost per Square Foot from typical sales in Sedona	N/A	N/A	3.4 Million	5.8 Million	2.2 Million
	Maintenance	Level of Maintenance Costs anticipated following implementation (H/M/L)		N/A	N/A	High	N/A	Medium
	Construction	Construction Cost (exclusive of ROW)	$ based on planning level assumptions	N/A	N/A	1.8 Million	1.7 Million	2.1 Million

Definitions Controlled Intersection: Roundabouts, Signals

As previously mentioned, the Level 2 Alternatives and this Evaluation Matrix were presented at Public Meeting #2. The public was encouraged to give feedback on which alternatives should be considered further. As a result of the Level 2 evaluation and public input, the Jackrabbit Alternative was considered least favorable of the three. However, all three Alternatives were identified as Preferred Alternatives because all are feasible in regards to community planning compatibility, visual impacts, environmental impacts, economic sustainability, neighborhood compatibility, and cost criteria. However, based on public and stakeholders comments received, the Javelina and Coyote alternatives were slightly refined and altered to better meet the criteria and needs of the community. The Preferred Alternatives are described in detail in Section 8.